

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claim 1 (canceled)

Claim 2 (currently amended): A method of manufacturing *n*-type semiconductor diamond, comprising:

a step of producing diamond incorporating *Li* and *N* by implanting into single-crystal Type IIa or undoped epitaxial diamond essentially not containing impurities *Li* ions at a dose of at least $3.0 \times 10^{15} \text{ cm}^{-2}$, and *N* ions at a dose such that the *Li* and *N* sum-total dose is at least $7.0 \times 10^{15} \text{ cm}^{-2}$, and so that ion-implantation depths at which the post-implantation *Li* and *N* concentrations each are at least [[10]] 1600 ppm will overlap; and

a step of annealing said diamond incorporating *Li* and *N* at a temperature in the range of from 800°C to less than 1800°C, under high-pressure conditions of at least 3 GPa;

whereby said diamond has a sheet resistance of not greater than [[$10^7 \Omega/\square$]] $1.4 \times 10^4 \Omega/\square$.

Claim 3 (currently amended): A method of manufacturing *n*-type semiconductor diamond in which *Li* and *N* ions are implanted into Type IIa or undoped epitaxial single-crystal diamond, the *n*-type semiconductor-diamond manufacturing method comprising:

a step of implanting the Li ions at a dose of at least $3.0 \times 10^{15} \text{ cm}^{-2}$, and the N ions at a dose such that the *Li* and *N* sum-total dose is at least $7.0 \times 10^{15} \text{ cm}^{-2}$, and so that ion-implantation depths at which the post-implantation *Li* and *N* concentrations each are at least ~~[[10]]~~ 1600 ppm will overlap, and so that the *Li* and *N* sum-total dose is less than or equal to ~~$5.0 \times 10^{16} \text{ cm}^{-2}$~~ ; and

a step of annealing the post-implantation diamond at a temperature in the range of from 800°C to less than 1800°C, under high-pressure conditions of at least 3 GPa;

whereby said diamond has a sheet resistance of not greater than ~~[[$10^7 \Omega/\square$]]~~
 $1.4 \times 10^4 \Omega/\square$.

Claim 4 (previously presented): An *n*-type semiconductor-diamond manufacturing method as set forth in claim 3, wherein an ion-implantation apparatus having an electron-beam line and two ion-beam lines is utilized to implant the *Li* and *N* ions simultaneously while radiating with the electron beam the single-crystal diamond that is ion-implanted.

Claim 5 (canceled)

Claim 6 (currently amended): Semiconductor diamond being Type IIa, single-crystal or undoped epitaxial *n*-type, incorporating, from a crystal face thereof to the same depth, at least ~~[[10]]~~ 1600 ppm of each of *Li* and *N*, and having a sheet resistance of not greater than ~~[[10^7]]~~ $1.4 \times 10^4 \Omega/\square$.

Claims 7-9 (canceled)